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The bifunctional enzyme chitosanase-cellulase produced by gram-negative microorganism Myxobacter sp. AL-1 is high similar to Bacillus subtilis endoglucanases.

Pedraza-Reyes M, Gutierrez-Corona F.

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The gram-negative bacterium Myxobacter sp. AL-1 produces chitosanase-cellulase activity that is maximally excreted during the statio phase of growth. Carboxymethylcellulase zymogram analysis revealed th enzymatic activity was correlated with two bands of 32 and 35 kDa. Ion-exchange-chromatography-enriched preparations of the 32-kDa enzy capable of degrading the cellulose fluorescent derivatives 4-methylumbelliferyl-beta-D-cellobioside and 4-methylumbelliferyl-beta-D-cellotrioside. These enzymatic preparations showed a greater capacity at 70 degrees C than at 42 degrees C to degrad chitosan oligomers of a minimum size of six units. Conversely, the beta-glucanolytic activity was more efficient at attacking carboxymethylcellul methylumbelliferyl-cellotrioside at 42 degrees C than at 70 degrees C. Tl 32-kDa enzyme was purified more than 800-fold to apparent homogeneit combination of ion-exchange and molecular-exclusion chromatography. Amino-terminal sequencing indicated that mature chitosanase-cellulase s more than 70% identity with endocellulases produced by strains DLG, P. and 168 of the gram-positive microorganism Bacillus subtilis.

PMID: 9297470 [PubMed - indexed for MEDLINE]

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Temporal secretion of a multicellulolytic system in Myxoba AL-1. Molecular cloning and heterologous expression of cel encoding a modular endocellulase clustered in an operon wi cel48, an exocellobiohydrolase gene.

Avitia CI, Castellanos-Juarez FX, Sanchez E, Tellez-Valencia A, Fajardo-Cavazos P, Nicholson WL, Pedraza-Reyes M.

Institute of Investigation in Experimental Biology, Faculty of Chemistry, University of Guanajuato, Mexico.

The Gram-negative soil micro-organism Myxobacter sp. AL-1 possesses five extracellular cellulases, the production of which is regulated by the g cycle. We cloned the complete gene for one of these cellulases, termed c which encoded a 67-kDa modular family 9 endoglycohydrolase, which w produced during the stationary phase of growth and was strongly enhanc avicel. The predicted product of cel9 matches the structural architecture 9 cellulases such as Thermonospora fusca endo/exocellulase E4. Cel9 pr synthesized in Escherichia coli from a multicopy plasmid and in Bacillus from the isopropyl thiogalactoside-inducible Pspac promoter and was pu from the culture medium. Thermal stability, optimum pH and temperatur dependence of Cel9 were similar when expressed from either source, anc indistinguishable from related cellulases produced by thermophilic bacte Downstream from cel9 was found a partial ORF, designated cel48, the d product of which was highly similar to bacterial exocellobiohydrolases a processive endoglucanases belonging to family 48 of the glycosyl hydrol The cel9 and cel48 genes appear to be arranged as part of an operon.

PMID: 11106416 [PubMed - indexed for MEDLINE]

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